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Journal of the Society of Arts.

FRIDAY, DECEMBER 26, 1862.

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NOTICE TO MEMBERS AND INSTITUTIONS.

Exhibition Catalogues.

Her Majesty's Commissioners for the International Exhibition of 1862 have placed at the disposal of the Council, for distribution to the Members of the Society and Members of the Institutions in Union, copies of the Industrial and Fine Art Catalogues.

Members of the Society desiring to have copies of each of these Catalogues may have them on application, either personally or by an authorised agent, at the Society's House.

Secretaries of Institutions in Union may have a number of copies placed at their disposal for distribution amongst their Members, on making a similar application, specifying in all cases the number required.

General Index.

A general Index to the first ten volumes of the *Journal* will shortly be published, which may be bound with the last volume. Members who desire to have copies (which will be supplied *gratis*) are requested to apply to the Secretary as early as possible, in order that a sufficient number may be printed.

EXAMINATIONS, 1863. — NOTICE TO INSTITUTIONS AND LOCAL BOARDS.

The attention of Secretaries of Institutions and Local Educational Boards is specially called to the following extract from the programme of examinations for 1863:—

5. A detailed list of the chairman, secretary, and other members of each Local Board, giving not only their names but their addresses and designations, should be submitted to the Council of the Society of Arts before the 1st of January, 1863. In some cases the Local Educational Boards comprise such large districts, that, for the convenience of the Candidates, Branch Local Boards have to be formed within the districts. Whenever this is the case, the names and addresses of the members, both of District Board and of its Branch Boards must be forwarded to the Secretary of the Society of Arts. All changes in the composition of the various Boards now in existence, or to be formed hereafter, should be immediately notified to the Society of Arts.

AWARDS OF MERIT AT INTERNATIONAL EXHIBITIONS.

In August last the Council of the Society of Arts issued a letter, inviting the opinion of the Jurors, the Commissioners for the Colonies and for Foreign countries, and the principal Exhibitors at the International Exhibition, on the question of Awards of Merit in connection with International Exhibitions; and requesting replies to the questions given below, with the intention of embodying the answers in a public report.

AWARDS OF JURIES.

1.—Are you of opinion that Awards for Merit, by medals or otherwise, in International Exhibitions, are desirable?

2.—State the reasons for your opinion.

3.—Ought Works of Fine Art and Designs to be excluded from the awards?

4.—Can you suggest any better method than the appointment of jurors for making the awards?

5.—Can you suggest any improvement in the constitution or proceedings of the juries?

6.—Is any appeal from the decision of the juries desirable?

7.—If you think awards undesirable, can you suggest any other means by which meritorious productions may be brought to the notice of the public?

8.—Have you any further suggestions to offer on the subject?

The following is a summary of the replies received. The figures attached to the replies correspond with those of the questions:—

Major-General Sir Frederick Abbott, K.C.B. Juror, Class XI., Sects. A. and B.—1. Yes. 2. They bring into notice excellencies of invention. 3. Would exclude fine arts. 4. Approves of juries. 5. Can suggest no improvement. 6. No appeal.

S. D. Addiss, Exhibitor, Class XXXIV.—1. No medal, but a report by a jury; see 4 and 5. 2. The public are the best judges. 4 and 5. Trade societies should select a jury of practical workmen, to be divided into classes, associated with independent gentlemen, to take the reports of such jury. 6. Appeal necessary, and gives his own case as an instance of the necessity. 8. A permanent exhibition would be more useful.

Alexander Andrews, Commissioner for Western Australia:—1. I am of opinion that awards for merit in the shape of medals are not desirable. 2. Because, in the present advanced state of manufactures in this country, there are so many houses who can arrive at the same amount of perfection, and can produce the same article of equal merit, that the award of a medal to any two, three, or even more, of them becomes an invidious, and, I may say, an unfair distinction. 3. Most decidedly; especially works of fine art, because it is so difficult to arrive at unanimity of opinion as to merit, there being no arbitrary rule generally recognised. 4. None. From what I have seen of the working of the jury system in connection with the present Exhibition, it has been, on the whole, excellent. More attention might be paid to the constitution of the juries, in the more careful selection of working jurors, for many members of the juries have paid little or no attention, although the great majority have been indefatigable, and, I believe, thoroughly conscientious in the discharge of their duties. 5. None other than suggested in the reply to query No. 4. 6. Most decidedly not. An appeal to any other quarter would open the door to much jealousy, and even give grounds for suspicion, however unfounded, of an undue influence being brought to bear, of favouritism, &c., &c. Moreover, it would make the jurors themselves less careful, and, on the whole, I think entirely undermine the system. 7. A report on the several sections and classes, specifying the most meritorious exhibitors and the particular points of merit (whether of quality of material, beauty of design, excellence of workmanship, general utility, cheapness of manufacture, or purity of quality, strength, &c., &c.,) which could be quoted by the successful competitors, would, I should think, be more esteemed than a medal.

8. I would add that these queries appear to me to affect more particularly articles of manufacture, and do not apply so much to raw products from the colonies, of which there may be only one or two exhibitors of each kind.

Charles Aubin, Exhibitor.—1. Not desirable unless fairly given. 2. Juries cannot understand hardware; inferior work has been rewarded; this is an injury to many. 3. If medals are given, works of art should not be excluded. 4. Jurors should choose workmen to assist. 5. Jurors should be well paid, and sworn. 6. Appeal desirable. 7. Awards undesirable unless given by practical workmen. 8. As regards 1862, if there had been no medals there would have been more satisfaction.

Thomas Bazley, M.P., Chairman of Jury, Class XVIII. —I think the appreciation of the public is the best reward which the exhibitor of any article can obtain. Juries I regard as superfluous. A good classification with a perspicuous arrangement would, in my opinion, most effectually facilitate the formation of a correct estimation of the merit of all articles displayed.

Dr. Beeg, Royal Commissioner for Bavaria, and Chairman of Jury, Class XXX.—In regard to the questions put by the Society for the Encouragement of Arts, Manufactures, and Commerce, in the circular of the 8th of August, I take the liberty to state my opinion briefly as follows:—1. The aim of the jury awards is to signify the merits of exhibited articles to the public, recommending them by this, so that the exhibitor gets honor and material profit by it. This aim is often, but not always, attained, because, 2. The present organisation of juries, mode of judging, and some influencing circumstances prevent it. The number of articles at the International Exhibition to be judged is so numerous that the most indefatigable zeal of the juries can hardly master them; the circumstances which must be taken into consideration are very often but imperfectly known, and this is partly the fault of the exhibitors themselves or their agents; the time which is allowed for judging is so limited, that even with the most sincere desire for justice and impartiality, it is nearly impossible to give in every case a correct judgment, to examine everything, and to consider every circumstance. On the other hand there are many exhibitors who manufacture specially for the Exhibition, articles not destined for the market and universal trade, on which no correct opinion can be formed. The result of these unfavourable circumstances is, that very often awards are given where they are not deserved, and in other cases they are not given where they ought to be, either by an oversight or error in judgment. Thus the awards lose the intrinsic value they should have, as the public put no confidence in them, and the exhibitors are not satisfied. Even such exhibitors as have got an award put sometimes less value on it when they see that one of their competitors, whose merits they very well know, remains unrewarded. I could name examples if it were not unnecessary, as everybody knows them. It is certainly impossible to make an arrangement of juries which in every case perfectly answers every wish; but there might be some alterations which, in my opinion, would improve in some degree the constitution of juries. I shall state them at once, answering Question 3 further on. 4, 5. There must be juries at exhibitions, otherwise a great inducement to exhibit and the encouraging character of the exhibition would be lost. We must first of all settle one most important question in regard to International Exhibitions. Are the exhibited articles to be judged without reference to the countries whence they come, the circumstances under which they are produced, or is it allowed to view them relatively? At the present exhibition the former view was prescribed; but I dare say it was quite impossible to obey strictly this rule, otherwise the majority of exhibitors from colonies or countries in which industry is not fully developed would have got no awards at all. But I am sure no one will say that an exhibitor, who has, on account of the unfavourable state of his locality, to overcome many and great obstacles, who is the pioneer of civilisation and industry in his town or country, does not deserve an encouraging award, although his exhibition falls short in merit, compared with the works of an exhibitor from a country arrived at the highest point of development. Should the first view be adopted, that only articles of the highest merit, without any relative consideration, should have awards, then all countries in an inferior state of industry are nearly excluded from competition. If, on the other hand, the circumstances of country and state of civilization are to be regarded, the difficulties of judging are materially increased; notwithstanding this, I am inclined to take the latter mode. The organisation of juries which I think advisable will answer for both, but particularly for the latter. *a.* Each manufacturer who exhibits, proves by this that he is enterprising and striving to gain public attention; he is rewarded for this by a commemorative medal, which he may make use of in any way he likes. One of his purposes, that of making himself more publicly known, is obtained by this. *b.* Awards are only given for progress displayed by the exhibitor, be it in the perfection of his articles, new inventions, new processes, or greater economy of production, great increase of his business, first introducing the manufacturing of certain articles in certain countries, &c., &c. *c.* Awards for such progress must be claimed, for the exhibitor has to show his progress in a sufficient manner, and to send in his claims before the commencement of the Exhibition, which are to be examined by an international commission. *d.* The International Exhibition Jury is formed according to the classification of the said claims, made by the commission, and in proportion to the number of claimants, from the different countries.— This system has already answered well in Wurtemburg, where they give progress medals at their annual exhibitions. It diminishes the labours of the juries in a remarkable way; gives a sure criterion in judging; allows a careful investigation; prevents oversight; has an encouraging character; and secures, indisputably, a high value to the awards. Can such a system be adopted or not? It should be, if possible. *e.* The working of the juries should not begin earlier than some months after the opening of an exhibition, when the arrangement of the articles is wholly complete, the catalogue corrected, and everything in order. *f.* The jurors should not only be men perfectly understanding their task—which they really generally have been—but determined to apply their time to the work, and not to leave the labour to but few of their colleagues, which sometimes has been the case. *g.* The jury-work ought not to be hurried, although it is advisable to fix a certain time for the performance of it. *h.* After the work is done and the jury dissolved, a commission should be formed, consisting of one member of each jury-class; this commission should take care that formal faults and errors in the printing of the jury-awards are properly corrected, but without being empowered to alter the jury decisions in any material way. *i.* The foreign commissioners should be consulted in regard to the exhibitors belonging to their countries. *k.* The jury-awards should not be published earlier than at the close of the exhibition. *l.* There should be different degrees of awards. In regard to the formal way in which the jury-work should be done, I take the liberty of describing the mode in which the jury of Class XXX. has acted, of which I have had the honour to be chairman at the present Exhibition. After the jury had daily assembled at a certain fixed time and place, it began the examination of the articles, conducted by one of the jurors, who had previously made himself acquainted with the class. The jury secretary had a number of papers on which he marked the number of the visited article and short remarks made in inspecting it, one leaf for each article. After about three hours' examination the jury went to an office to compare notes and to fix awards. The secretary took one leaf after an other of the inspected articles; the proposition of reward or not rewarding was made by the juror (or a juror) from the country from which the article in question had come. Thus, an Englishman proposed for the articles from the United Kingdom, a Frenchman for the French, and where the country was not represented in the jury the chairman proposed. In most of the cases there was unanimity of opinion and according to the notes made individually at the inspection; where it was not so, a show of hands decided. The secretary noted the decisions in case of award on the respective leaf, and wrote the minutes after these, which were read the following day. At the end these note-leaves were arranged in packages; each country had its own package, containing separately the leaves noted with medals or honourable mentions, or with no award. By this means it was possible to ascertain immediately if any article had been inspected or overlooked. Certainly every jury is at liberty to arrange its proceedings as it thinks proper, but it seems advisable to propose a method which has already answered well. 6. The decisions of the juries must be unalterable, and therefore no appeal to revise them should be allowed. To avoid formal faults, it is necessary to have the jury reports and lists of awards carefully looked over by the acting commissioners (home and foreign), as I have already remarked. The Commission could even remain till about some weeks after the publication of prizes to investigate any blunder pointed out by the press or in any other quarter; but, I repeat it, only formal ones, not altering the jury-decisions, for if the latter are wrong in some cases, the responsibility rests only with the juries. 7 is already partly answered. I think juries and the awarding with prizes cannot be abolished without endangering the character of exhibitions, and depriving them of one of their most attractive inducements. Public reports alone would not suffice. We all know what a system of puffing is very frequently going on, and if the commission would instal impartial reporters, why, then, it is nothing but a kind of jury. I am for juries and awards. I think it advisable that works of Fine Arts should not be judged by juries; articles of industry are subject to the judgment of the public, because they are objects of common use and trade in general; works of Fine Arts are judged by individual taste, and it would be very difficult to find jurors who are universally regarded as authorities. The competition of artists is quite another thing to that of industrial manufactures. It is even a question if exhibitions of works of Fine Arts should not be kept entirely separate from industrial exhibitions. But some token of having taken part in an art-exhibition might be given to artists; and, perhaps, in the form of a medal. 8. Universal exhibitions should be regarded as standing in immediate connection, although held in different countries. There are but two countries which, for some time to come, are in a position to hold them, England and France. The political constitution of Germany will hardly allow it; besides, the larger German towns are in such situations that the transport of goods has many difficulties. As there are, then, but two countries fit for being the arena of such industrial festivals, it is not very difficult to arrange a plan upon which they might be conducted. It is particularly to be desired; *a.* That the classification of industrial articles be one and the same at all exhibitions. The classifications hitherto adopted, have not answered well, although they were made upon scientific principles; still they left many doubts where to place many articles, and, in consequence of this, many of them were put by the different countries in different classes of the catalogue, which caused some articles to be judged twice and even oftener by different jury-classes, others were not judged at all, and, at all events, labour was multiplied. To arrange a classification for future exhibitions, an international commission, consisting of only a few persons, should be entrusted with the task. Even if the new classification did not suit every wish, and should contain some arbitrary decisions, which, of course, there must be still it would be of great advantage to have such a one, as all, by their constant practice in arranging the goods, the catalogues, and the juries, would get accustomed to it. *b.* Such jurors as have proved their ability and willingness for the jury-work, should be enrolled again, as they are already acquainted with the firms, and most able to judge any visible progress. As there must always will be some jurors acting the first time in this capacity, they will get initiated into the business by the jurors who have already got experience. I acted this time with three jurors who had been my colleagues at the Paris Exhibition, 1855, and we felt great benefit by it. *c.* Particular care should be bestowed on the reports; they are the history of the development of industry, of civilisation, in our century, and should be regarded in that light. Not only by that which deserves praise, but also by that where faults have to be pointed out, we may learn, and it should not be left to mere chance, whether a report of a certain class is meagre or satisfactory. The jury reports themselves ought not to be more than a correct list of awards, with a statement of reasons; but to each jury-class should be attached a special reporter (who could be also juror), who should accompany the juries, and be in communication with the acting commissioners (home and foreign), to get the necessary general and special statistics, and write the report. One of these reporters might be entrusted to bring together all these reports, to put them into unison, and to act as general reporter. Such a mode should be adopted at all future exhibitions, and then the reports would be of invaluable and standing importance. In perusing my paper again I find that I have expressed my opinion but imperfectly, partly in using a foreign language, partly in consequence of my desire to be as brief as possible.

The Hon. and Rev. Samuel Best, Juror, Class XXIX. —1. I do not think they could be carried out without them in one form or another. 2. They almost of necessity imply some such stimulus. 3. No. 4. No. 5. I think the juries should consist of a defined and limited number, each of whom should sign the list of medals, &c., and thereby certify that he has examined each article to which a medal or other mark of honour has been awarded. It should also, I think, be laid down clearly that a medal is not to be given except for a distinct merit declared, that is, not for general merit, but for some particular production, and that this production should be new since the last exhibition. 6. I think it is, but the appeal should be made within a fixed time, and the jury of appeal be constituted by the selection of one from each jury, who would then be able to state the reasons which influenced the jury in its decisions.

Daniel Biddle, Juror, Class XXIV.—1. Yes. 2. The award of prizes causes emulation among the exhibitors, many of whom would make no display of goods at all, were it not for this incitement to do so; this consideration applies more particularly to foreigners, who set a very high value on the distinction of obtaining medals. 3. I am incapable of offering an opinion on this subject. 4. I cannot. 5. It appears to me most desirable that the chairman and deputy-chairman of the juries should be chosen on account of their practical knowledge of the articles in their respective classes, and not for their position in society. The jurors, when at their work, often need an authority to whom to appeal, therefore a thorough practical acquaintance with business seems to me the most desirable qualification in a chairman. 6. Decidedly not. 7. If opinions on the peculiar merits of each article exhibited were not given by competent jurors, the public would very easily be misled by the judgment of the press, or of other critics unable to judge properly of the various exhibits. The reward of "honourable mention" does not appear to be much valued by English exhibitors. I should suggest two classes of bronze medals, as far more desirable; the inferior class to be awarded wherever merit could be discovered, and the first class to any goods possessing particular excellence, or displaying novelty of invention or execution. I am strengthened in this opinion as to the desirableness of two kinds of medals, by the fact that the great majority of articles exposed are worthy of commendation in some way, and this would be still more the case if greater care were taken to exclude all inferior or merely ordinary work. 8. (I.) Men who have acted as jurors or commissioners at former Exhibitions should have the preference over others, as their previous experience is often useful to others as well as themselves. (II.) Much time and annoyance would be saved if more power were given to the superintendent of each class, and to the chairman of each committee. Exhibitors have had just cause to complain of the hindrances often thrown in the way by unnecessary routine, and of the want of a courteous manner in some of the officials. (III.) Greater judgment should be exercised in classifying the goods for the jurors, as in some instances men have been called upon to give opinions respecting exhibits concerning which they have little or no practical knowledge. I may cite my own class (XXIV.), in which are included lace, embroidery, couch and upholstery trimmings, gold and silver ornaments for military purposes, tapestry, fringes, buttons, &c. A juror well qualified to adjudicate upon lace and embroidery will generally know little or nothing about the merits of guimps, buttons, &c. (IV.) I would suggest that dealers in goods seem to me fitter for the office of juror than manufacturers of the goods. The former have more opportunity of comparing one description of article with another, while the latter are apt to be partial to their own productions.

William Bird, Juror, Class XXXI.—1. Desirable, if a standard of merit could be found, but undesirable where such a standard is impossible. 2. From differences of opinion as to what merit consists of, the variety and degree of merit, the difficulty of finding to what individual the merit or degree of merit may belong, the apportioning between several claimants, and the suppression of the truth and suggestion of the false, frequently made by the exhibitor. 3. Yes, as there is no real standard in taste. 4. No, except to decrease their numbers. 5. To limit the number in each class to three, or five at the utmost, of which only one should be theoretical, the others technical, and avoiding manufacturers of articles of the class they are jurors in. 6. Yes, to a body selected from each jury, say one each, to be a court of appeal. 7. A supervision as to articles to be exhibited, and a medal to each exhibitor, not as a mark of merit, but merely as a *souvenir*. The public are the best jurors, and frequently reverse the decisions of juries. 8. The total repeal of our patent laws as the greatest boon both to inventors and manufacturers, and science and art generally.

Richard Birkin, Deputy-chairman and Reporter, Class XXIV.—1. Yes. 2. Universal incentives to exertion. 3. Sees no reason why the Fine Arts should be excluded. 4. No. 5. None, except securing a larger number of practical men as jurors. 6. No appeal unless on ground of insufficient information having been furnished. 8. Better to have gold medals in addition, for special cases of merit.

Henry Black and Son, Exhibitors, Class VI.—We think it not advisable to attempt to distinguish merit at International Exhibitions by medal or otherwise. 2 *a*. Because, in most instances, no amount of care and good faith on the part of persons appointed to decide can prevent their being, to some extent, biased by preconceived opinions. *b*. Because it is very difficult, if not impossible, to distinguish between merits of different kinds; and justice can only be done by distributing prizes broadcast, which process would of itself render them valueless. *c*. Because the same goods may often be finished in totally different styles, one rough, another ornamental, and while one jury may consider low price a point to be rewarded, another may think high finish most desirable, though neither low price nor high finish are correct tests of cheapness. *d*. Because, in many manufactures, continued use is the only reliable test of superiority between articles of nearly equal merit, and this cannot be applied by a jury. *e*. Because the jurors can have no reliable information that the goods exhibited are of the description usually supplied by the exhibitor, or even that they are made by the class of persons usually in his employ, or that they are made under his own superintendence. *f*. Because the prize once awarded, places in the hands of an unscrupulous exhibitor a sort of guarantee, under cover of which he can supply an inferior article; if to this it be answered that the public must themselves take care that they are properly served, we reply that this can be quite as readily or more readily done without the intervention of prizes at all. 6. Appeals would be open to the same objections as the original awards, and the bias would naturally be to support the original decision. 7. All meritorious productions have equal opportunities of becoming known, unless special prominence be given to some by the awards of so-called judges. A demand having once created a supply, the supply must necessarily flow into the proper channel, and the present methods of communication are such that no really meritorious production need long be confined within circumscribed limits. 8. Our own experience of prizes leads us to place very little reliance on them.

Sir John P. Boileau, Bart..—1. Yes. 2. They stimulate exertion, and frequently aid its reward. 3. No. 4. No; if jurors are selected as they ought to be. 5. Should be partly men cognizant practically with the objects exhibited, and partly independent men of intelligence, and attentive to science, art, and manufacture. 6. No. 7. None equally good. 8. None.

Beriah Botfield, M.P., F.R.S., Juror, Class XXXVI. —1. Yes. 2. They encourage exhibitors. 3. No. 4. No. 5. No. 6. No. 7. Answered in number 6. 8. None.

Bowron, Bailey and Co., Exhibitors.—1. Yes, but not by medals. 2. Public judgment requires to be directed. 3. Yes; in matters of fact the public can judge for themselves. 4. Cannot. 5. A single medal does not distinguish the degrees of merit, and hence may mislead. Certificates of merit of different degrees should be given. 6. Yes; for errors must occur which ought to be set right. The judgment appealed against should be sent back to the jury for reconsideration, and if then not satisfactory, the point should be left to arbitration.

Richard John Boyall, Carriage manufacturer, Exhibitor.—1. Yes, under certain circumstances. 2. Cause emulation. 3. No. Excellence should always have its reward. 4. Properly constituted juries are best. 6. Yes, if awards are given as in 1862.

Sir David Brewster, K.H., F.R.S., Juror, Class XIV.—1. Certainly. Instead of medals, special certificates of merit, or diplomas, should be given, and signed by one or more jurors. 2. No reasons can be required for publicly rewarding merit of any kind. 3. Certainly. 4, 5. A jury of persons who speak different languages is a great evil. The diplomas of merit should be signed by persons who have specially examined the inventions or processes, or articles to be rewarded. Each jury should be divided into groups, and special duties assigned to each group. 6. There should be an appeal only when there is a considerable difference of opinion among the jurors.

Charles E. Bright, Commissioner for the Colony of Victoria.—1. Yes; by a single medal or honourable mention. 2. If awards were not given, exhibitors would not receive support from manufacturers or inventors. An article receiving a medal for merit, or honourable mention, is thereby advertised, and becomes at once known to the public. 3. Awards for merit might be given for works of fine art and designs, but not for competition. 4. No. 5. Each jury should be made distinctly aware of what class of articles it has to adjudicate upon, whether manufactured or otherwise. 6. Yes; in cases only where a particular article has been passed over and not noticed by the jury of the class to which it belongs. 7. Awards are desirable. 8. No.

John Brown, of the firm of John Brown and Co., Atlas Works, Sheffield, Mayor of Sheffield, and Juror, President of Sect. A, Class XXXII.—1. Yes; but awards should only be given to actual producers, and in no case to mere exhibitors. 2. Because the recognition of merit in any production, when the jury are men who possess public confidence, is in itself a recompense to the producer, and is also a sure means of obtaining for him the pecuniary reward which he is entitled to receive. 3. Certainly. 4. No; it is above all things necessary that the jurors be free from personal interest or bias. 5. No. 6. Certainly not. 7. Any means by which meritorious productions may be brought to the notice of the public is, *de facto*, an award of merit. 8. No.

James Buckman, Professor Royal Agricultural College, Cirencester; Juror, Class III.—1. Rewards of two kinds: one a medal, the other a parchment certificate; the first for inventions and original discoveries, the second for exhibitors. 3. Would not exclude the Fine Arts. 5. Classes should be much sub-divided for jury work. 6. Appeal to some paid responsible officer to correct mistakes. 7. Can suggest no better means. 8. As subdivision of classes would seem to require more jurymen, suggests that two competent men are sufficient for a jury.

Gen. Sir John F. Burgoyne, G.C.B., Chairman of Jury, Class XI.—1. The result of my experience, as a juror, on the classes for Military Art and Implements, in 1851, 1855, and 1862, leads me to an impression that, attempting to make awards for merit, by juries, at such exhibitions, is unsatisfactory; for the following reasons:—1. Where so much excellence is displayed on every side, it becomes in many cases almost a matter of caprice, or of the importunate admiration of one or two jurors in favour of an object, to obtain the selection for the honour of a medal or of honorable mention. 2. In a very large proportion of cases, the articles are exhibited for a display to the world of their commercial value; favourable awards are then made use of as important testimonials of their superior character over those of rivals who may, or may not have exhibited, and give a weight to them beyond what many may be reasonably entitled to. This indeed may be, and is carried so far, that having received a medal for some distinct article or process, is held out as a testimony in favour of a whole establishment, where many articles may not have any claim to peculiar superiority. 3. However conversant the jurors may be with the subjects generally submitted to their decision, in many cases they have neither the time nor means for forming a perfectly correct judgment on them. Many articles that are new, however promising and attractive, may require the test of trial and experience; and if for common use, and not merely as specimens of what it is possible to obtain, the more or less facility and cost of production are essential elements of merit, and cannot be always within the cognisance of the jury, except on the word of the exhibitor, who may naturally be over confident. 4. A principle of courtesy to nationalities at these general exhibitions, that are open to the whole world, must have a great influence in the decisions, and operate against perfect impartiality.

A. Campbell, M.D., Juror, Class III., Section B.—1. Yes. 2. Medals take a position analogous to orders of merit. 3. No. 4. No, notwithstanding their imperfections. No one should be a juror who cannot devote his whole time to the work. 5. Paid jurors and officers to prepare the work. 6. No; except in very special cases.

Charles James Case, Exhibitor, Class VI.—1. Yes. 2. Necessary for the sake of emulation. 3. No. 4. No. 5. Jurors should be practical men. 6. Yes. 7. No. 8. Appeal necessary; refers to his own case.

J. P. Charley, Juror, Class XIX.—1. I prefer no awards, but only a general report by some qualified, efficient authority. 2. The great difficulty in discriminating—the discontent and bad feeling always created among competitors, the encouragement to "puffing," for which the medals are often desired, and the great expense to quiet respectable firms who do not advertise, and who must compete or lose *prestige*. Goods sent to exhibitions are mostly special, and not fair specimens of general make. 3. Certainly. 4. No. 5. No. 6. Certainly not; it would be fatal to order, and cause increased bad feeling. 7. Public opinion is, in my mind, sufficient, and would, I think, be preferred by most exhibitors. 8. These exhibitions ought not to be too frequent; once in ten years is often enough.

W. H. Child, Exhibitor.—1. Yes. 2. Gives a stimulus to improvement. 3. No. 4. No. 5. Juries should be selected by the manufacturers of each class, five in number, and no exhibitors on them; if of sufficient importance, seven—3 English, 3 foreign, and a Commissioner for Chairman. 6. Yes; if class or majority dissatisfied.

(*To be continued.*)

BRITISH ASSOCIATION, CAMBRIDGE, 1862.

On Economising Fuel in Iron-plated Ships of War

The following is an abstract of a paper read in section G.—Edward Allen, Assoc., I.C.E, M.I.M.E., Assoc., I.N.A.

There are several important reasons why every effort should be made to economise the consumption of fuel in the ships of our new iron-plated fleet, viz:—Additional weights, increase of speed and distance to be steamed, increased despatch in moving from station to station, and of time during which steam power will probably be used even under ordinary circumstances, and increase in the cost of coals, owing to the continual increasing size, power, and number of steam ships in the Royal Navy.

To these reasons for economising fuel we may add: The universal deficiency of boiler power in ships of the Royal Navy, necessitating a relative increase of space being allowed for this portion of the machinery; as also the fact now generally admitted that much smaller vessels than those first constructed will be necessary in order to constitute an efficient fleet; these small vessels being of course as thickly plated as the very largest, if not more so, on account of their speed being considerably less.

From the particulars given in the following table, it may be stated, that in most of our iron-plated ships the weights of the three items, viz., the armour plating, the machinery, and the fuel, are very nearly equal, and that together they constitute about one-third of the total displacement, *i.e.*, in vessels plated amidships only. Marine engines of good construction, when working full power, exert a force, when measured by indicator, considerably above their nominal power; and it is a rule with the Admiralty that all engines supplied to them shall work up to at least four times this nominal power. Now the average consumption of fuel in marine engines of the ordinary but best construction being about 4½lb. per indicated horse power per hour, it follows that a nominal horse power requires about 4 cwt. of best coals in the day of twenty-four hours, so that a 1,000-horse power engine would consume something like 200 tons of coal per day when working full power. Comparing this quantity with that for which stowage is given in the iron-plated ships of the Royal Navy, it will be seen that the best of them carry no more coal than would serve them for about four days' full steaming.

We are, nevertheless, told that in all or nearly all cases, seven days' supply is provided, but this can only be on the supposition that the engines are not intended to work full power the whole of the time; indeed, with the ordinary boilers used on board war steamers, this is not possible, for it is well known that full steam cannot be kept for more than twenty-four hours together.

Table of all Iron-cased Ships and Floating Batteries building or afloat, with assumed weights of their armour plating, and quantity of coals carried, the latter deduced from difference of draught with and without coals.

	Afloat, or Building, &c.	Iron or wood.	Wholly or partially cased.	Length.	Beam.	Mean draught ready for service.	Diff. without coals.	Tonnage.	Nominal H.P.	Assumed weight of coals carried.	Assumed weight of armour plates.
				ft. in.	ft. in.						
Agincourt	Building	Iron	Partially	400 0	59 3½	25 8	1 7	6,621	1,350	1,000	850
Minotaur	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Northumberland	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Achilles............	,,	,,	,,	380 0	58 3½	26 3½	1 10½	6,079	1,250	,,	800
Black Prince......	Afloat	,,	,,	380 2	58 4	25 11	1 8	6,109	,,	950	,,
Warrior...........	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Hector	Building	,,	,,	280 0	56 3	24 8	1 0½	4,063	800	450	450
Valiant	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Defence	Afloat	,,	,,	,,	54 2	24 11	1 4	3,720	600	550	,,
Resistance	,,	,,	,,	,,	54 1	,,	,,	3,710	,,	,,	,,
Caledonia	Building	Wood	Wholly	273 0	58 5	25 10½	1 6½	4,045	1,000	650	950
Ocean	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Prince Consort...	Afloat	,,	,,	,,	,,	25 11½	1 7½	,,	,,	,,	,,
Royal Alfred ...	Building	,,	,,	,,	,,	25 10½	1 6½	,,	800	,,	,,
Royal Oak.........	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Royal Sovereign	Converting	,,	,,	240 7	62 0½	22 11	1 5	3,963	,,	550	750
Prince Albert ...	Building	Iron	,,	240 0	48 0	20 0	1 9	2,529	500	230	,,
Favourite	,,	Wood	,,	225 0	46 9	20 5	1 4½	2,186	400	400	...
Enterprise.........	,,	,,	Partially	180 0	36 0	14 7½	1 7½	990	160	100	...
Erebus	Afloat	Iron	Wholly	186 8½	48 6	8 9	1 3¼	1,954	200	80	...
Terror	,, Floating batteries.	,,	,,	186 3	48 8	,,	,,	1,971	,,	,,	...
Thunderbolt......	,,	,,	,,	186 11	48 5¾	,,	,,	1,973	,,	,,	...
Ætna...............	,,	Wood	,,	186 0	43 11	8 2	1 3	1,588	,,	300	...
Glatton	,,	,,	,,	172 8	45 2½	8 9	1 3	1,535	150	60	...
Thunder	,,	,,	,,	172 6	43 11	8 11	1 4	1,469	,,	80	...
Trusty	,,	,,	,,	173 6¼	45 1¾	8 8	1 3	1,539	,,	60	...

The very great increase of power necessary to propel any given vessel at an increased speed renders it a matter of some difficulty to obtain a rate of speed in the iron-cased ships such as that believed to be desirable. If a certain power be necessary to drive any given vessel of good form at ten knots per hour, then to increase the speed of the same vessel to twelve knots, will require nearly double that power; to increase it to fourteen knots the power must be nearly three times as great, and to increase it to sixteen knots the power will require to be more than qua drupled. The estimated speeds of our new ships of war' even in smooth water, are considerably less than those thought necessary *at sea* by naval men and many others, and the difference is as much as one and a half to two knots per hour.

Six of the largest vessels are estimated to attain about fourteen knots per hour; five of them about twelve knots; two of them about eleven and three-quarter knots per hour; four of them about eleven knots; one about ten and three-quarter knots, and one only nine and a half knots; and in the vessels tried even these speeds have not been attained; whereas fifteen knots per hour has been very generally assigned as the speed below which our new iron-plated ships of war should not be propelled when at sea. In favour of such speed we have the opinions of Mr. Scott Russell, Mr. Samuda, Captain Halsted, Commander Oldmixon, Admiral Moorsom, and many others.

With regard to the distance which such vessels should be able to go without recoaling, we have the most distinctly expressed opinion of Mr. Scott Russell and Captain Halsted, as well as those who have commented upon their views, that 5,000 miles should be the minimum, whereas none of our ships could, with their ordinary supply of coal, go one-third of that distance.

With respect to the increased cost of coaling the ships of the Royal Navy, it will be found that the charge on this head is now over £300,000 per annum, and in war time more than double the ordinary amount is expended. What will it be, even in times of peace, when a fleet of iron-cased ships of the *Warrior* class shall have been formed?

The present Surveyor of the Navy says:—"As far as my experience goes, no ship of any class or with any makers' engines has sufficient boiler space; there is not one of the multitudes I have tried that has steam enough to keep the throttle valve open for two hours. The steam drops directly the vessel goes over nine knots, and this not in one or two, but in all without exception. * * * * Nothing is so wasteful of fuel as too small a boiler: intense firing and incomplete combustion of the fuel is the inevitable result of trying to keep up steam in such a case. * * * Not a step is made in the right direction of obtaining speed and economy until more attention is paid to the proper proportion between the quantity of steam used in the cylinders at each stroke, and the quantity remaining in the boiler."

He says that 600-horse boilers should be used where 450-horse power boilers are now employed, and the ships would go faster, not perhaps rush past the measured mile quicker, but in a chase of four or five hours.

The Committee on Marine Engines, reporting upon this and other evidence, observe:—"It appears that in general the boilers supplied to our men of war are deficient in generating steam, and that full speed in consequence can only be maintained for a short time. Now the remedy for that defect must necessarily involve the whole question of the amount of space that can be allotted to the boilers."

It has been long known that many vessels in the merchant service have been working now for some years upon just one-half of the fuel consumed in ships of the Royal Navy. In proof of this, Mr. Allen quotes the opinions of Mr. Charles Atherton, late Chief Engineer of Woolwich Dockyard, and of Mr. Andrew Murray, Surveyor to the Board of Trade.

The principles of construction on which this important saving is made may shortly be stated as follows:—

1st. Proportionate increase of boiler power.
2nd. Expansion of the steam to say 5lb. pressure.
3rd. Jacketing the cylinders.
4th. Superheating the steam.
5th. Condensing by surface instead of by jet; and
6th. Heating the feed water.

And all this may be done without increasing the pressure of steam above 20lb. or 25lb., although the higher the pressure of steam, the greater the economy of fuel.

It is difficult to assign the exact proportionate value of each of these six modes of economising fuel, as they have seldom, if ever, been so far separated as to admit of correct deductions; but, taken altogether, there is now no doubt that *fifty per cent.* may be saved in the ordinary consumption of fuel. This saving has been practically effected in several vessels where the principles above stated have been carried out.

In the early part of 1855 the author read two papers at Birmingham on "The Commercial Economy of Expanding Steam in Marine Engines," and described several new forms of engines suited to this purpose, and, in 1858 sent detailed drawings of engines to the Admiralty, the designs being made with a view to effect a large saving in fuel. One of these was that of concentric cylinders, with three piston rods and cross heads, the two outer rods being carried to a guide block, from which the connecting rod was returned to the crank; this arrangement being precisely that adopted in the Swedish gunboats, and for which a medal has been awarded to the maker in the Exhibition.

In the early part of the present year he again addressed the Admiralty, calling their attention to this subject, and requesting the favour of an examination of the engines constructed on his patent of 1855, by Messrs. J. and G Rennie, and which may be described as double expansive end-to-end cylinders, the small cylinder being placed at the back of the large one, motion being communicated to the crank by means of double piston rods. Even this arrangement has, it appears, been recently tried on one of the Swedish vessels of war, the results of working being, it is said, very satisfactory.

In these several applications to the Government, the author's object was to show how the expansive principle could, in his opinion, be best carried out in ships of war, fulfilling the necessary conditions of such vessels, *i.e.*, of keeping the weights down as much as possible and the machinery below the water level.

He showed, in his papers, that the suggested alterations in marine engines could be made without either adding to the gross weights carried or to the space occupied in the ships, and that a very considerable saving of coal would be the result; increased capacity of cylinder to allow of full expansion of the steam, being, of course, under every possible arrangement absolutely necessary.

One of the forms of marine engines suggested by the author in 1855 has lately been adopted in the case of the *Poonah's* engines, now building by Messrs. Humphreys and Tennant, the small and large cylinders being placed end to end, as above described, with reference to the engines made by Messrs. Rennie, but motion being given to the crank shaft by means of a trunk working in the large cylinder.

For these several forms of double expansive engines the author claims the following advantages:—

1st. Capability of fully expanding the steam without the use of expansion gear.

2ndly. Great uniformity of motion by reason of the steam from the boiler acting upon a comparatively small area, not pressing upon the large pistons until partially expanded.

3rdly. Saving of considerable weight on account of the strength of the connecting rods, piston rods, &c., being only necessarily proportioned to the pressure of the initial steam on the small piston and the expanded steam on the large area, instead of the initial steam on the latter; or, rather, upon a considerable extension of it, as in the case of a single acting cylinder designed for great expansion, its AREA must be greatly increased, the stroke not being capable of being lengthened.

4thly. Considerable saving of steam owing to the loss in the clearances in the small cylinder being made less than that in a very large cylinder, the loss in the latter case absorbing a large percentage of the steam.

5thly. The cylinders being in line with each other, no increase in the number of piston rods, connecting rods, or guides is necessary.

6thly. That, practically, all the advantages of a long-stroked engine are obtained without increasing the stroke, which cannot be done owing to the speed of revolution of direct acting screw engines being necessarily high.

And 7thly. That by fully expanding the steam, a far less quantity suffices for the production of a given power, thus allowing of the boilers being reduced a third or a fourth, still leaving a large proportionate increase in boiler power compared with the steam required.

It will be readily admitted, on all hands, that very considerable difficulties would be found in making ordinary marine engines fully expand their steam, an increase in the capacity of the cylinder of from two to three times being essential.

At present the shape of the cylinders of marine engines approaches to that of those of rivetting machines, their diameter being frequently 2½ times the stroke; whereas in pumping engines, in which economy is studied, the cylinders assume an entirely different form, their lengths being three times their diameter. Indeed, all engineers admit that, in very short cylinders, *i.e.*, single acting ones, economy is out of the question. It is, therefore, greatly to be regretted that, in our iron-plated ships, even in those of the largest class, the same form of engines has been adopted as was employed fourteen years ago, notwithstanding Mr. Atherton, the late engineer at Woolwich Dockyard, recommended some years ago that "double expansive engines ought to be tried," especially as superheating of the steam had been carried out.

In the twenty-six iron-cased ship constructed and constructing, a force of no less than 18,310 nominal horses power is to be employed, and when working full power, every day will witness an unnecessary consumption of upwards of 1,700 tons of coals, which, on foreign stations, would certainly amount to more than £5,000.

This loss is, however, not what is to be most regretted; but rather the fact that our iron-cased fleet, the largest vessels of which are to cost upwards of £350,000 each, and are provisioned for four months, should only carry coals enough for from four to five days' steaming.

If it be maintained that the quantity of coals carried is sufficient—which, I think, the Admiralty authorities would hardly acknowledge—even then is it not better to increase the armour plating, or the speed of the vessels, by reducing their draught or increasing the power of the engines, rather than to carry an unnecessary quantity of expensive fuel?

It is now certain that the speed of the *Warrior* and *Black Prince* is much below what was anticipated. And even if a speed of fourteen knots were obtained, under the most favourable circumstances of clean bottom, clean tubes, and fair weather, this would be reduced to about twelve knots at sea, running days together; and this is no less than three knots below the speed that has been considered necessary. Again, if the present quantity of fuel carried be enough, the engine power could be increased some 40 per cent. without increasing the draught of water, and still allow of the same number of days' fuel. This increase of power would increase the speed about one knot and a half per hour, which cannot be regarded as a matter of slight importance.

With these facts before us, the question arises, "Are we justified in continuing to employ engines of the ordinary kind in our iron-plated ships of war?"

Our present navy consists of vessels in which there is a nominal power of upwards of 142,000-horses, distributed in about the following proportions:—

	Horse-power.
Ships in commission	60,000
Do. in ordinary	51,000
Do. used as transports, &c.	13,000
Do. (new iron-plated) and batteries	18,000
Total	142,000

The ultimate extent of our iron-cased fleet, of course, is not as yet known, but taking the very moderate estimate made by Mr. Scott Russell, we have yet engines to provide to the extent of, at least, 60,000-horse power, making a gross power of 200,000-horses.

Assuming that one-half of these vessels are in commission in time of peace, the daily consumption of coal when working full steam would be over 15,000 tons at the present rate per indicated horse power.

Now ships in commission may be fairly assumed to be one-third of their time under steam, say two days per week, or 100 days in the year. They will probably be half this time under easy steaming, and the remainder three-quarters and full steaming, and will consume from 2½ to 3 cwt. of coal per day, or 14 tons per annum per nominal horse power, or for the whole of the ships in commission about 1,400,000 tons per annum. This is, then, what we may look forward to in the navy returns in future years of peace, *i.e.*, if the present consumption of fuel be maintained. It is just half this quantity which experience has now fully proved may be saved by a modification in the mode of constructing and working marine engines, and this saving of fuel will give us one or other of the following advantages in addition to the money saving, viz:—

Increase of armour plating 50 per cent.; or,

Increase of speed to the extent of one knot and a half; or,

Increase of number of days' fuel to double what it now is; or,

Diminished draught to the extent of 8-in. to 12-in., according to the vessel.

Thus enabling us to have armour-plated vessels of comparatively very small tonnage.

To all this we must not forget to add the loss of time, expense, and inconvenience, of frequent coaling when only five or six days' supply are carried; and, again, the cost and labour of trimming the coals and feeding the furnaces with double the quantity which would be needed with good double expansive engines.

It is hoped that these considerations will induce the Lords of the Admiralty to turn their attention to the advantages of working steam expansively in the vessels of the Royal Navy, not simply as it has hitherto been done, and when the power is proportionately diminished and no saving effected, owing to the machinery not being adapted for expansive working, but constantly and regularly in ordinary working and under proper conditions, when its advantages would be at once experienced.

In conclusion, it is only fair to mention that soon after the appearance of the report of the Committee on marine engines, recommending that the number of contractors for government engines should be increased, and that the best engines should be adopted in ships of the Royal Navy, by whomsoever proposed to be supplied, orders were issued for three pairs of engines, designed to work with less fuel than usual. Messrs. John Penn and Son supplied a pair of large trunk engines, with surface condensers; Messrs. Maudslay a three-cylindered arrangement, also with surface condensers, designed by Mr. Sells; and Messrs. Randolph and Elder a six-cylindered arrangement, also with surface condensers.

Neither of these vessels has as yet been fully tried, the results, however, being anxiously looked for by engineers.

Considering the nature of these three plans, which, with the exception of the trunk engines, involve considerable complexity, the trunk and three cylinder arrangements being, moreover, single expansive engines, it is very doubtful if the results can be altogether satisfactory; and certainly cannot be so far so as to warrant experiments stopping at the point at which they have now arrived. Trials should at least be given of such other arrangements as appear likely to give favourable results.

The double-expansion end-to-end cylinder engines proposed by the author in 1855, for ships of war, having now been very ably worked out by Messrs. J. and G. Rennie, and, it is understood, been favourably reported upon by the inspecting engineer of the Admiralty, who was instructed to examine them, it is hoped an opportunity will shortly be afforded of testing their suitability for her Majesty's ships; the success of the principle of double expansion being already fully established, and Messrs. Rennie being prepared to guarantee to the Government that the consumption of fuel shall not exceed 2 to 2¼ lb. per indicated horse power per hour, or half the ordinary consumption.

GALLERY OF INVENTIONS AND SCIENCE, FREE PUBLIC LIBRARY AND MUSEUM, LIVERPOOL.

This gallery is under the management of a committee appointed by the following societies:—The Architectural and Archæological Society, the Chemists' Association, the Historic Society of Lancashire and Cheshire, the Literary and Scientific Society of Liverpool, and the Liverpool Polytechnic Society.

The officers are:—President, Colonel Wm. Brown (founder); Chairman, Alderman Bennett; Treasurer, G. F. Chantrell; Honorary Secretary, John Abraham. It is intended to be a permanent institution for the transitory exhibition of useful inventions and manufactures, and to assist the public in keeping pace with the progressive development of the arts and sciences.

This it is proposed to effect by providing space gratuitously for the exhibition of articles which illustrate the practical applications of science or of mechanical skill, with other objects of interest, but to continue this privilege only so long as the objects exhibited maintain their claim to public attention by excellence or novelty. The committee have, therefore, reserved to themselves the right to withdraw any object when its public interest fades, and thus make room for others which in their turn may serve a term of usefulness; but, as each application for space contains also an agreement for time, which is equally binding on both parties, until its expiration the committee will not exercise their power of removal.

The benefit of the public is secured by giving absolutely free admission to the gallery, and the advantage to exhibitors is found in the publicity thus obtained. This, however, is still further increased by the permission to affix a description to each object, and attach the price when saleable; and other information may be left with the superintendent, who will be the medium of communication between the public and the exhibitors.

It will thus be seen that the objects of the Institution are twofold—the instruction of all who seek knowledge, and the benefit of all who have applied that knowledge usefully.

ORIGIN OF PETROLEUM.

Dr. J. B. Edwards, in the *Pharmaceutical Journal*, says, the flow of oil from mineral springs is by no means new either to science or commerce. Herodotus has recorded that the island of Zante furnished large quantities, while Pliny and Dioscorides describe the oil obtained from Agrigentum, a small town of Sicily. The Persian springs at Bakoum have yielded to the value of 600,000 dols. annually; and the earth oil from Rangoon, in Burmah, has been exported to the extent of 400,000 hogsheads yearly. The streets of Genoa and Amiens were formerly lit by a petroleum obtained from Parma. In 1847, a spring was discovered in Yorkshire, which was successfully worked by Mr. James Young, of Glasgow, until exhausted, when he turned his attention to the distillation of coal, and discovered paraffin oil. The marvellous oil springs of the New World, however, far surpass in extent and interest all previous discoveries, and the quantities already yielded, without apparently diminishing the supply, show that this will be a most important article of commerce for some years to come.

Home Correspondence.

BRITISH MINERALS.

Sir,—The following list of British minerals, and of colonies in which minerals are found, will be interesting as a supplement to Mr. Hunt's valuable paper, read last Wednesday evening.

I am, &c., JAMES TENNANT.

List of Minerals given in "Manual of the Mineralogy of Great Britain and Ireland," by Robert Phillips Greg, F.G.S., and William G. Lettsom. London (1858), Van Voorst.

Class I.—NON-METALLIC MINERALS.

Order.—I.—Carbon.

1. Graphite.
2. Coal.
    a. bituminous coal.
    b. non-bituminous coal.
    c. brown coal, &c.

Order II.—Water.

3. Ice.

Order III.—Resin.

4. Amber.
5. Copaline.
6. Middletonite.
7. Retenite.
8. Schleretinite.
9. Burytite.
10. Bitumen.
    a. Naphtha.
    b. Petroleum.
    c. Elaterite.
    d. Asphaltum.
11. Torbanite.
12. Ozocerite.
13. Hatchetine.

Order IV.—Sulphur.

14. Sulphur.

Order V.—Fluorine.

15. Fluor-spar.
16. Fluellite.

Order VI.—Chlorine.

17. Rock-salt.
18. Sal-ammoniac.

Order VII.—Carbonates.

19. Arragonite.
20. Calcite, &c.
21. Strontianite, &c.
22. Witherite.
23. Barytocalcite.
24. Alstonite.
25. Dolomite.
26. Breunerite.
27. Ankerite.
28. Hydrocalcite.
29. Pennite.
30. Hydromagnesite.

Order VIII.—Oxides.

31. Brucite.

Order IX.—Sulphates.

32. Anhydrite.
33. Barytes.
34. Celestine.
35. Mascagnine.
36. Epsomite.
37. Alum.
38. Gypsum.
39. Websterite.

Order X.—Phosphates.

40. Apatite.
41. Wavellite.
42. Childrenite.

Order XI.—Silex and Silicates.

43. Quartz, &c.
44. Opal, &c.
45. Garnet, &c.
46. Idocrase.
47. Epidote, &c.
48. Zoizite?
49. Felspar.
50. Labradorite, &c.
51. Albite.
52. Saussurite ?
53. Muscovite.
54. Biotite.
55. Staurolite.
56. Andalusite, &c.
57. Kyanite.
58. Beryl.
59. Spodumene.
60. Killinite.
61. Obsidian, &c.
62. Isopyre
63. Iolite (Cordierite).
64. Zircon.
65. Olivine.
66. Gadolinite.
67. Allanite.
68. Wollastonite.
69. Augite, &c.
70. Bronzite.
71. Hypersthene.
72. Diallage.
73. Babingtonite.
74. Hornblende.
75. Natrolite.
76. Scolezite.
77. Mesolite, &c.
78. Faröelite (Mesole).
79. Thomsonite.
80. Stilbite.
81. Epistilbite.
82. Heulandite.
83. Chabasite, &c.
84. Gmelinite.
85. Levyne.
86. Laumonite.
87. Phillipsite.
88. Brewsterite.
89. Analcime.
90. Harmotome.
91. Edingtonite.
92. Weissigite ?
93. Prehnite.
94. Allophane.
95. Chlorite.
96. Aphrosiderite.
97. Kammererite.
98. Margarodite.
    a. Nacrite.
    b. Gilbertite.
    c. Talcite.
99. Talc-steatite.
100. Lithomarge.
101. Saponite.
102. Kaolin.
103. Pinite.
104. Apophyllite.
105. Pectolite.
106. Gyrolite.
107. Serpentine, &c.
108. Topaz.
109. Chondrodite.
110. Lepidolite.
111. Tourmaline.
112. Datholite.
113. Axinite.

Order XII.—Alumina and Aluminates.

114. Corundum.
115. Spinel.

Class II.—METALLIC MINERALS.

Order I.—Gold.

116. Gold.

Order II.—Silver.

117. Silver.
118. Argentite.
119. Pyrargyrite.
120. Horn silver (kerate).

Order III.—Platinum.

121. Platinum.

Order IV.—Iron.

122. Metallic Iron (meteoric).
    Appendix. Meteoric stones.
123. Hematite (specular iron).
124. Magnetite.

125. Gōthite.
136. Limonite.
127. Siderite.
128. Ilmenite.
129. Iserine.
130. Cronstedtite.
131. Vivianite.
132. Scorodite.
133. Pharmacosiderite.
134. Beudantite.
135. Melanterite.
136. Iron alum.
137. Fayalite.
138 Chlorophæite.
139. Green earth.
    a. Glauconite.
    b Kirwanite.
140. Pitticite.
141. Pyrites.
142. Marcasite, &c.
143. Pyrrhotine.
144. Mispickel.

Order V.—Manganese.

145. Pyrolusite, &c. (Varvicite).
146. Manganite.
147. Psilomelane.
148. Wad.
149. Diallogite.
150. Rhodonite.

Order VI.—Nickel.

151. Annabergite.
152. Emerald nickel.
153. Millerite.
154. Eisen-nickelkies.
155. Nickeline (kupfernickel).

Order VII.—Cobalt.

156. Asbolane.
157. Erythrine.
158. Smaltine.
159. Cobaltine.

Order VIII.—Copper.

160. Copper.
161. Cuprite.
162. Melaconite.
163. Pitchy copper.
164. Malachite.
165. Chessylite.
166. Liroconite.
167. Tamarite.
168. Clinoclase.
169. Olivenite.
170. Cornwallite.
171. Erinite.
172. Libethenite.
173. Lunnite.
174. Blue vitriol.
175. Brochantite.
176. Chrysocolla.
177. Condurrite (Domeykite)
178. Copper glance.
179. Kupferindig (Covelline).
180. Tennantite.
181. Tetrahedrite.
182. Chalcopyrite.
183. Erubescite.
184. Bournonite.
185. Connellite.
186. Molybdenine.
187. Molybdenite.

Order X.—Tungsten.

188. Tungstic ochre (Wolframine.)
189. Scheelite.
190. Wolfram.

Order XI.—Tin.

191. Cassiterite.
192. Stannine.

Order XII.—Titanium.

193. Rutile.
194. Anatase.
195. Brookite.
196. Sphene.

Order XIII.—Arsenic.

197. Arsenic.
198. Arsenite.

Order XIV.—Antimony.

199. Kermes (Red antimony).
200. Cervanite.
201. Antimony ochre (Stiblite).
202. Bleinierite.
203. Antimonite.
204. Berthierite.

Order XV.—Bismuth.

205. Bismuth.
206. Bismuth ochre.
207. Bismuthine.
208. Daphyllite (Tetradymite).

Order XVI.—Uranium.

209. Uran-ochre (Zippeite).
210. Pitchblende.
211. Chalcolite (Uranite).
212. Autunnite.

Order XVII.—Lead.

213. Lead ?.
214. Minium.
215. Plattnerite ?.
216. Cerussite.
217. Anglesite.
218. Linarite.
219. Leadhillite.
220. Susannite.
221. Lanarkite.
222. Caledonite.
223. Pyromorphite, &c.
224. Mimetite.
225. Vanadinite.
226. Stolzite.
227. Wulfenite.
228. Galena.
229. Jamesonite.
230. Kilbrickenite (Geocronite).
231. Mendipite.
232. Matlockite.
233. Cromfordite.

Order XVIII.—Zinc.

234. Calamine.
235. Aurichalcite.
236 Smithsonite.
237. Goslarite.
238. Blende.

Order XIX.—Cadmium.

239. Greenockite.

Order XX.—Chromium.

240. Chrome oxide.
241. Chromite.

SUPPLEMENT.

1. Apjohnite.
2. Agalmatholite.
3. Bole.
    a. Erinite.
    b. Rhodalite.
    c. Fuller's-earth.
    d. Rock-soap.
4. Calcareo-sulphate of barytes.
5. Calcareo-sulphate of strontian.
6. Doranite.
7. Leedsite.
8. Mineral charcoal.
9. Nitro-calcite.
10. Pipe-clay.
11. Potter's clay.
12. Pigotite.
13. Plinthite.
14. Rotten-stone.
15. Scarbroite.
16. Stannite.
17. Supersulphuret of lead (Johnstonite).
18. Tuesite.
19. Verrucite.

THE BRITISH COLONIAL POSSESSIONS,

IN WHICH TWO HUNDRED ADDITIONAL MINERALS ARE FOUND.

Australia, South
Australia, Western
Bahamas
Barbados
Bermuda
British Columbia
Canada
Cape of Good Hope
Ceylon
Channel Islands
Dominica
Honduras, British
India
Jamaica
Malta
Mauritius
Natal
New Brunswick
Newfoundland
New South Wales
New Zealand
Nova Scotia
Prince Edward's Island
Queensland
St. Helena
St. Vincent's
Tasmania
Trinidad
Vancouver
Victoria

MR. HUNT'S PAPER ON MINES.

SIR,—But for a nervous dislike to public speaking generally, I should have risen on Wednesday evening to express the pleasure I had felt in listening to Mr. Hunt's valuable and interesting paper on the "Mines and Minerals of the United Kingdom," and also to take part in the discussion that followed, if only to remove one or two impressions from the minds of the speakers, which I am sure it was never Mr. Hunt's intention to convey.

Will you permit me, therefore, to offer a few remarks through the *Journal* of the Society.

The objects of Mr. Hunt's paper, or some of them, were to show the vast mineral resources of this country; to impress upon the mining community the necessity for improved education; and that "mining, commenced with proper judgment, legitimately carried onward, guided by the advice of experienced miners, and directed by honest intentions, is as satisfactory a speculation as any in which a capitalist can engage." He also gave a short sketch of the manufacture of fraudulent companies, which do so much injury to mining.

In all this Mr. Hunt has shown us, and not for the first time, that genius can throw a halo of interest around the dullest subject; but as in some pictures, minor tints or shades are introduced which, from particular causes, may leave a more lasting impression on the mind than the main subject of the picture itself—so the dark shadow of Mr. Hunt's paper appeared to me as though it produced more effect upon subsequent speakers than he intended that it should. And I would observe in the first place, as a public journalist for the last 25 years, engaged in supporting legitimate mining, and in exposing and condemning those bubble companies described by Mr. Hunt, that although the general truthfulness of his description of such companies must be acknowledged, experience shows that they are not by any means confined to mining pursuits, and bear, indeed, a small proportion to the number which have been promoted in banking, in railways, and other commercial undertakings; and while the very speculative character of mining offers more than usual facilities to designing adventurers, Mr. Hunt might as well have called the late British Bank a specimen of English banking, as the bubble company he described an illustration of British mining in its integrity, and as pursued on a large scale throughout the United Kingdom.

In the next place, Mr. Hawes remarked upon the fact that about 350,000 persons were employed in the production of minerals of the value of thirty-five millions per annum, which gives, as he said, "the production of each miner not more than about £2 per week each; an amount so small, that he could hardly conceive it possible that it would remunerate the large capital which was invested in these mines." I confess I am at a loss to understand this sort of reasoning upon the subject, or to find out by what means Mr. Hawes arrives at his conclusions.

If a farmer takes 1,000 acres of land to cultivate, he must spend, even in such a certain pursuit, a capital of £10,000 before he can get a return for his outlay; and in mines, where there is great uncertainty and delay, it sometimes happens that £50,000 or £100,000 have to be expended before remunerative returns can be made.

During the last 18 years, the profits paid by mines in Cornwall and Devon amount to £4,529,285 12s., and the average number of profitable, or dividend mines per annum during that period has been about 43. Many young mines, employing a large number of hands, have not yet made any returns whatever, and are entirely carried on by the capital of shareholders. A still greater number make returns trifling in proportion to their cost of working; but out of these classes of progressive mines, a few every year become profitable, and by this sort of legitimate speculation, the mineral returns, so important to the arts, science, and commerce of the country, are kept up; and I do not see in any way how sound calculations can be formed on the basis of Mr. Hawes's remarks. Out of the 350,000 persons employed, a very large proportion consists of girls and children, whose pay is about 10d. per day, and the average amount received by the whole 350,000 will not be more than 12s. per week each.

Mr. Hunt referred to, and indeed the *Journal* has given very copious extracts from, the mineral statistics that he publishes annually, and I hope he will pardon me for suggesting that they should be published earlier in the year. The returns of 1861 appeared in November of the present year, and much of their very great value, as works of reference, is thus lost. I mention this because I am told the fault rests not with Mr. Hunt, but with the "Circumlocution Office."

Twenty-one years ago, in 1841, when mining statistics were as difficult to obtain as agricultural statistics are at the present day, I commenced a work, the first in modern times, to call public attention to the mineral resources of this country, and it occupied me two years to collect the statistics required for it. But afterwards the task became comparatively easy, and for many years past I have been able to publish the annual returns of the principal metallic mines the first week in January; and the publication of the returns of our collieries, &c., not more than a month later, would be an invaluable boon.

I could have wished, also, that Mr. Hunt had given us his own idea of the formation of mineral veins, and was surprised that no reference was made in his paper to electricity. It is well known that all our large deposits of mineral are found in the vicinity of, or in contact with, cross courses, or veins of clay, elvan, &c., &c., running in a different direction to the mineral veins; and without such interruptions to the general strata a mine is considered of little value; and one theory in reference to this is, that these cross-courses interrupt the current of electricity passing through metallic veins, and the minerals held in solution are thus condensed, and form large bodies of ore. While on the subject of electricity, I would add that to its agency, also, it is supposed "dowsing" or using the "divining rod"—the existence of which, Mr. Rawlinson says, "is a serious reflection upon the age"—owes its powers. I am not a believer in the art myself, but some years ago I went on a "dowsing" expedition with a friend in Cornwall, accompanied by a professor and firm believer in it, and a description of the process may not be uninteresting. The "dowsing" or "divining" rod is a hazel twig, with two branches like the prongs of a fork. The "dowser" grasps one of the prongs in each hand as firmly as he can, presses his elbows close to his sides, and by a movement of the wrist turns upwards that part of the rod which would be represented by the fork handle. This position is a most constrained one both for nerve and muscle; and in it, myself, friend, and dowser marched like skirmishers across several fields where lodes were known to crop nearly to the surface, without any result except to the professor, whose upraised portion of the rod dropped down once or twice with a sudden jerk, and each time, as the "dowser" declared, when he passed over the back of a mineral vein; and the only explanation I could get was suggested by my friend, that some persons were particularly susceptible of electrical influences; and that in the very constrained position they placed themselves in when "dowsing," their nervous systems were affected by the electric currents in the mineral veins passed over, and the power to sustain the rod in its upright position lost. At any rate, as many persons who have heard of this "divining rod," may never have heard the manner of using it explained, I describe it just as it took place—even at the risk of being told that "it is a reflection upon the age we live in."

In conclusion, I would add, in reference to mining speculations and Professor Tennant's remarks, that, from the fact of my having published, in addition to other works, a review of the Progress of Mining, every year for the last 19 years, I have, perhaps, been consulted in these matters as much, or perhaps more, than any other person in London, and my advice has been :—1st. Never speculate at all, unless with money you can afford to lose. 2nd. Never embark in any mine whatever, and particularly such as are offered through the means of prospectuses, in large numbers of shares, without obtaining the honest advice of a practical, disinterested agent in the district where the mine is said to be, and this can always be had for a fee of £2 2s. 3rd. In embarking, even in profitable mines, never confine yourself to one, but, on the principle of insuring ships at Lloyd's, divide your risk into five or six sound undertakings, and, in the aggregate, success will attend you.

Were these rules adhered to, we should have few bubble companies to complain of, and mining would take the rank that its importance demands.

I am, &c.,
J. YELLOLY WATSON, F.G.S.
Effra House, Brixton, Dec. 20th.

Sir,—Mr. Hunt's paper, read last Wednesday evening, was certainly one of the most interesting on this subject I have ever listened to, showing well the use he has made of the various means in his power of acquiring an acquaintance with the subject. Referring to the manner in which mine companies are got up, I may say I agree with him to a great extent in what he has stated—indeed, what I daily see, and the numerous letters I get on the subject, prove the extent to which many are wilfully deceived. But there is one class of miners to which, in justice to them, I think prominence enough was not given, and that is the class of "honest men," who, when any of them have decided on searching for mineral in a piece of ground (or mine sett), or on the re-working of some ancient mine which may seem to hold out good chances of success, invite their friends and connections to join them, and go on with it on the same terms as themselves, that is without those now very large and fashionable premiums which unprincipled projectors often state as "purchase money," and put into their own pockets. Men of this class deserve support, and are generally successful. They must be regarded as quite a distinct class from those who "mine" only in the pockets of adventurers. I am myself largely connected with a mine divided into less than 1,000 shares, the total outlay on which is not so much as £6,000; but for this comparatively small sum we have cleared up an old mine, about 100 fathoms deep from the surface, furnished it with a 24-inch cylinder pumping engine, and 18-inch cylinder drawing engine, water stamps, and all pitwork and other machinery complete, and I think it will now soon give profits. Mining in this way may, I think, be considered fairly safe, and I mention this as one instance going to prove that it is a good medium for investment and speculation.

I have very little doubt that water plays a very important part in the deposition of ores in veins. This and electricity, I think, are the prime agents. We know well the depositions from water which flows over or through iron-stone beds. It deposits iron very freely after such passage, on its further route.

In the "Relistian" mine, in Gwinear, Cornwall, many years since, when it was re-opened after having been closed a very long time, and having been previously productive of tin—on this re-opening, a great quantity of the crystals—some of them very fine—of the oxide of tin were found deposited against the sides of some of the levels; and in another old mine, my father has mentioned to me that he had seen crystals of tin formed or deposited in an old shoe! These plainly show that the tin must have been held in solution by the water, and deposited under some very peculiar circumstances, in the positions named. In the Museum at Penzance also there is part of a stag's horn, a portion of which looks as if it had been converted into oxide of tin, and crystals of the same cover part of the remaining portion. "Cross lodes" and "elvan courses" play a very important part in deposits of ores, the largest and richest branches of ores, especially copper, being found generally in connection therewith. However, I will go no further in this subject at present. I was very glad to hear Mr. Hunt reply to Professor Tennant's remarks on the ignorance of "mine agents." Mr. Tennant had, unfortunately, by some means, come across an ignorant man, and forthwith selected him as a type of his class. Nothing could be more absurd; no party of adventurers, having the smallest regard for their own interests, would select a man to look after their mine who did not know well the common forms of the common ores of tin, copper, arsenical and sulphuric, mundic, &c., &c.

Mr. Hawes referred to the statistics of Mr. Hunt, in which it was stated that about £35,000,000 worth of ores were annually produced by 350,000 persons employed in their production, or a produce of little more than £2 per week, per head; deducing from this mode of calculation the impossibility, after paying these persons so employed, of obtaining any remuneration for the capital invested in mines themselves. This mode of calculation is erroneous, inasmuch as a great proportion of the persons employed in mines are boys and girls, who do not get more than a very few shillings per week. There are also other considerations against this view of the case.

I am a miner, and the son of a miner; I have been engaged therein from my earliest youth, and I am convinced of this—that, with ordinary caution (as in other speculations), and with perseverance, it is a pursuit that pays well, and is as legitimate a business as any under the sun. Suppose all were to stop mining, from its "risky" character, where would Britain be in a few years without her minerals and the endless industry created thereby? It is perfectly true that our knowledge of the laws which regulate mineral deposits is very limited, but there was a time when the various processes for the manipulation of iron ore, puddling, &c., were almost unknown; and we have reason to hope that, now so much attention is being drawn to this, the hidden processes of nature and her action as regards mineral veins will be investigated in such a way as to lead to some results towards the desired end. Already many of our best mine agents, although they cannot say that the ore shall and will be found to a certainty in a certain spot, can with tolerable certainty pronounce that it *will not* be found in certain situations, and this is one link in the chain.

Nature's own operations in the crust of the earth are very slow, vast periods of time being required to produce the various changes therein—periods of time in comparison to which science is in its veriest babyhood. It is not, then, to be wondered at that some of nature's greatest laws are but very faintly understood by poor mortal, fleeting man—man who, though he may record for succeeding man all he may have acquired, yet his life is so very short that ere his mind has properly adapted itself to its great research, old age and death come on him, and he leaves his reasons, thoughts, and opinions to others for re-digestion and consideration, who in turn go off the stage in the same manner.

In conclusion, I cannot help making a remark on the facility and contentedness with which the public spend their money in *foreign* mines. Many millions have been recklessly thrown away in foreign mining without one word of complaint, while if a few thousands happen to have been unfortunately laid out at home, what a grumbling and discontent there is.

Mining is, in its very nature, *risky* and very speculative, and occasional losses as well as large profits must be expected and allowed for. It is also very "charming." "The Pleasures of Hope" are pretty well known to those who embark in it freely—but I again say that those who do so embark *judiciously* generally do fairly well.

I am, &c.,
JAMES HOLLOW.
Lelant, Hayle, Cornwall, December 18, 1862.

Proceedings of Institutions.

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BACUP MECHANCS' INSTITUTION.—In the last occasional circular, dated December, 1862, the directors rejoice that a measure of success has attended their efforts to provide instruction, combined with rational amusement, in the course of Wednesday evening lectures and entertainments which has been organised and in part carried out. That these efforts are appreciated by the members and the public, the large and influential audiences which have assembled on each occasion afford sufficient testimony. The directors in issuing this, their second circular, point with satisfaction to the lectures yet to be delivered, embracing, as they do, subjects of high and varied interest, and opening up to the members refined sources of enjoyment calculated to improve the understanding and purify the taste. The directors earnestly solicit the continued patronage of the wealthier portion of the community to these lectures. The cost of their arrangement is considerable, and it would be a matter for regret that in a pecuniary sense they should prove unsuccessful. The directors ardently desire that the Institution may be enabled to tide over the present time of depression without incurring any debt, and to this end they urge the members, individually, to exert their influence in obtaining others to join, by pointing out the advantages to be derived from a connexion with the Institution. The following are the arrangements for lectures:—December 3rd, Mr. D. W. Greenhalgh, of Stubbins, on "The Air We Breathe," illustrated by apparatus and numerous experiments; December 10th, Robert Crossland, Esq., of Bury, "Lord Brougham, the Orator and Statesman;" December 17th, Rev. T. Lawson, of Bacup, "Popular Proverbs," and a selection of music by the tonic sol-fa class; January 14th, Rev. J. Swann Withington, of Rawtenstall, "A Trio of Great Men of Our Nation:—Cromwell and Government, Newton and Philosophy, Milton and Poetry;" January 21st, Mr. J. P. Meaden, of Haslingden, "Combustion, and some of its Phenomena," illustrated by numerous experiments; January 28th, David Thomas, Esq., of Bury, "America, Past and Present;" February 11th, Rev. H. C. Anson, of Cloughfold, "The Brain and Nervous System," illustrated by numerous drawings and casts; February 18th, Mr. A. Stansfield, of Todmorden, "Electricity," illustrated by numerous experiments; February 25th, T. T. Wilkinson, Esq., F.R.A.S., &c., of Burnley, "The Popular Customs and Superstitions of Lancashire;" March 4th, William Mitchell, Esq., of Waterfoot, "Athletic Sports;" March 11th, Thomas Baldwin, Esq., C.E., of Bury, "The Steam Engine—Heat, what is it? Steam, its nature and action—The Steam Engine, its effects on the social condition of man;" March 18th, A. Fletcher, Esq., M.D., of Bury, "The Marvels of the Invisible, or an Evening with the Microscope," illustrated by microscopic specimens; March 25th, Joseph Chattwood, Esq., of Bury, "Readings from an Old Manuscript," illustrated by geological specimens. The library contains upwards of 1,500 volumes, in every department of literature, and additions are constantly being made. It is open on Tuesday evenings, from eight to half-past nine, and on Saturday evenings from half-past six to eight o'clock. The news-room is open daily (Sundays excepted) from eight a.m. to half-past ten p.m. The chemistry class is under the management of Mr. H. P. Meaden, of the East Lancashire Union of Institutes, and is in union with the Science and Art Department, South Kensington, in the annual examinations of which the pupils are entitled to compete. Classes in all the ordinary branches are taught, and as the Institution is in union with the Society of Arts, London, the East Lancashire Union of Institutes, the Lancashire and Cheshire Association of Institutes, the members have the privilege of competing in the various examinations which take place annually, in all of which prizes and certificates are awarded. The female classes, for the study of the elementary branches, meet two nights in each week, and are conducted by a qualified female teacher. The various examinations are open to the members of these classes. The local annual examination of the evening classes will take place in March next, when prizes of considerable value will be awarded to the successful candidates. The annual coffee party was to be held on Christmas Eve, December 24th. The annual *soirée* will take place on Friday, the 2nd January, 1863. Thos. Bazley, Esq., M.P. for Manchester, and other gentlemen, are expected to be present and take part in the proceedings. P. Delavanti, Esq., and others are engaged for the occasion.

To Correspondents.

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ERRATUM.—In the last number of the *Journal*, p. 98, col. 1, line 4, for "prohibited" read "protected."

MEETINGS FOR THE ENSUING WEEK.

TUES. ...Royal Institution, 3. Professor Frankland, "On Air and Water." (Juvenile Lectures.)
THURS...Royal Institution, 3. Professor Frankland, "On Air and Water." (Juvenile Lectures.)
FRI.......Philological, 8.
SAT.......Royal Institution, 3. Professor Frankland, "On Air and Water." (Juvenile Lectures.)

PATENT LAW AMENDMENT ACT.

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APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

Dated 29*th November*, 1862.

3202. T. Lloyd, Liverpool—Imp. in and applicable to the wheels of vehicles.
3206. J. C. Robertson, Gracechurch-street, and W. C. White, King-street, Regent-street—An improved tap or cock.
3208. D. Sutton, Banbury, near Oxford—Imp. in apparatus for washing linen and other fabrics and garments.
3210. R. K. Penson, Ferryside, Carmarthenshire—Imp. in apparatus used for warming railway carriages. (A com.)

Dated 1*st December*, 1862.

3212. H. L. Emery, 72, Sloane-street, Chelsea—Imp. in thrashing machines.
3214. G. F. Griffin, New Adelphi Chambers—Imp. in the permanent way of railways.
3316. J. Irwin, Wellingborough, Northamptonshire—An improved machine for cultivating land.
3224. A. V. Newton, 66, Chancery-lane—Imp. in the construction of steam and other vessels. (A com.)

Dated 2*nd December*, 1862.

226. H. Twelvetrees, Bromley—An improved sawing, filing, mortising, and turning apparatus.
3228. P. Brassert, St. Anne's-road, Brixton—Imp. in apparatus for saving life and property in cases of fire and burglary.
3232. T. Cook, Manor-place, Walworth—Imp. in envelope folding machinery.
3236. A. P. Charles, High-street, Wapping—Imp. in candles and night lights, and in the lamps or apparatus for burning the same.
3238. H. J. Simlick, Osborne-place, Whstechapel—Imp. in the manufacture of cigars and pipe lights.

Dated 3*rd December*, 1862.

3240. H. Wilde, Manchester—Imp. in electro-magnetic telegraphs, and in apparatus connected therewith.
3242. R. B. Thomas, Anderton, Devonshire—An improved apparatus for turning over the leaves of music.
3246. I. I. Abadie, Rue de Mulhouse, Paris—Imp. in the mannfacture of imitation lace and guipure veils and other analogous articles.

Dated 4*th December*, 1862.

3250. J. Grant, Albion-place, Maidstone—Imp. in the construction of turn-tables for portable railways.
3252. J. Braddock, Droylesden, Lancashire—Certain imp. in machinery or apparatus for effecting the separation of impurities from the water employed in steam boilers, and also for effecting the circulation of the said water.
3254. G. Lewal, 74, St. George's-road, Pimlico—A hot-air apparatus in cast-iron or any other metal or substance consisting of prismatic tubes, to be applied to chimnies with flues and heat conduits. (A com.)
3256. J. Robinson, Liverpool—Imp. in the construction of ships and vessels.
3258. R. Wallis, Basingstoke—Imp. in apparatus for loading and unloading vessels and transporting sacks, casks, and other packages or parcels from one landing-place or stage to another or to or from one warehouse to another.

3260. T. G. Webb, Manchester—Imp. in the manufacture of articles of pressed glass.

[*From Gazette December* 12*th*, 1862.]

Dated 17*th October*, 1862.

2803. J. Summerton, Smethwick, Staffordshire—Certain imp. in harrows for harrowing land,

Dated 29*th October*, 1862.

2912. W. Clark, 53, Chancery-lane—Imp. in apparatus for ascertaining and recording the speed and distance travelled by vehicles, the flow and quantity of water, and other analogous purposes. (A com.)

Dated 6*th November*, 1862.

3007. Major-General W. N. Hutchinson, Plymouth—Imp. in apparatus or means for protecting the screw of steamers from becoming entangled with or fouled by ropes or other bodies.

Dated 12*th November*, 1862.

3047. T. Bradford, Fleet-street—An improved clothes wringer and mangler, applicable to pressing the liquid from clothes in the process of washing and other pressing purposes.

Dated 13*th November*, 1862.

3055. G. W. Rendel, Newcastle-on-Tyne—An improved method of strengthening armour plates made of carbonised iron or steel.

Dated 20*th November*, 1862.

3120. J. W. Child, Halifax—Imp. in means and apparatus for working wool and other fibres.

Dated 21*st November*, 1862.

3131. J. Steart, 5, St. James's-road, Blue Anchor-road, Bermondsey—An improved method of extracting the fibre from zostera marina and other aquatic vegetable productions.

Dated 24*th November*, 1862.

3155. W. Tatham, Rochdale—Imp. in machinery or apparatus for preparing and spinning cotton, wool, flax, and other fibrous materials.

Dated 25*th November*, 1862.

3166. W. Longley, Leeds—Imp. in machinery for making bricks.

Dated 27*th November*, 1862.

3177. A. A. Pheloux, 75, Rue Quincampoix, and P. A. Paumier, 9, Rue Christine, Paris—A new atmospheric sailing propeller.
3179. T. Keyworth, Boston, Lincolnshire—Imp. in motive power machinery.
3183. D. Veerkamp and C. F. A. V. Trigt, 11, Mercer's-terrace, Limehouse—Imp. in the treatment of old manufactured fabrics, in order to obtain useful fibrous products therefrom.
3185. W. Clark, 53, Chancery-lane—Imp. in gas burners. (A com.)

Dated 28*th November*, 1862.

3186. J. Carbonell, 15, Passage des Petites Ecuries, Paris—Imp. in preparing, manufacturing, and washing the paper pulp derived from the esparto plant, and in apparatus connected therewith.
3187. W. A. Waddington, 44, Stonegate, York—Imp. in machinery for cutting wood.
3189. J. H. Johnson, 47, Lincoln's-inn-fields—An apparatus for indicating the pressure of electric conductors in foreign bodies. (A com.)
3191. J. Cresswell and E. T. Greves Birmingham—Imp. in the construction of hearses and funeral carriages.
3192. S. J. Browning, Portsmouth—Imp. in machines to be employed in brewing.
3193. W. Clark, 53, Chancery-lane—Imp. in the permanent way of railways. (A com.)
3195. J. F. Delany and J. C. R. Okes, Victoria Foundry, Greenwich—Imp. in double cylinder expansive steam engines.

Dated 29*th November*, 1862.

3199. T. Blackburn and M. Knowles, Blackburn—Imp. in looms for weaving.
3200. F. G. Taylor, Manchester—Imp. in washing machines.
3201. J. Crompton, Bolton—Imp. in machinery or apparatus for ploughing, harrowing, clearing, and drilling land.
3024. W. Clark, 53, Chancery-lane—An improved machine for cutting corks and other stoppers. (A com.)
3205. F. Vacher, Parliament-street—Imp. in ornamenting playing cards.
3207. Rev. H. Moule, Fordington, Dorsetshire—Imp. in locomotive engines, and in apparatus for generating steam for steam engines.
3209. J. Anderson, Royal Arsenal, Woolwich—Imp. in the manufacture of the tyres of railway wheels, and rails, switches, and crossings of railways.
3211. M. Henry, 84, Fleet-street—Imp. in the manufacture of leather. (A com.)

Dated 1*st December*, 1862.

3213. P. Bourne, Whitehaven—Imp. in miners' lamps.
3215. T. Waller, Fish-street-hill—Imp. in stoves.
3217. R. Flude, Aylestone-street, Leicestershire—Imp. in looms for weaving narrow fabrics.
3216. J. Romer, Shipbourne, Kent—Imp. in the manufacture of bullion wire and metallic fine drawn wire.
3220. W. Clark, 53, Chancery-lane—An improved apparatus applicable as a pump, water meter, hydraulic motor, or a steam engine. (A com.)
3221. P. W. Reuter, Buckland-crescent, St. John's-wood—The preparation of a new compound to be used for dyeing and printing purposes. (A com.)
3222. E. D. Johnson, Wilmington-square—Imp. in pocket watches.

Dated 2*nd December*, 1862.

3225. H. Twelvetrees, Bromley, Middlesex—Imp. in apparatus for cleaning knives, forks, and boots.
3227. H. Twelvetrees, Bromley, Middlesex—Imp. in washing, wringing, and mangling machines.
3230. G. F. Blumberg, Cannon-street West—An improved method of, and apparatus for, producing designs in or on glass.
3231. Capt. J. Wheatley, R.N., 9, Glucks Strasse, Munich—Imp. in the construction of ships of war and in the manufacture of armour plates for ships, forts, and batteries.
3233. G. T. Bousfield, Loughborough-park, Brixton—Imp. in forming the permanent ways of railways. (A com.)
3234. G. T. Bousfield, Loughborough-park, Brixton—Imp. in apparatus for discharging guns or ordnance. (A com.)
3235. D. Graham, Edinburgh—Imp. in steering and manœuvring ships or vessels, and in the apparatus employed therein.
3237. R. K. Cautley, Thorney, Cambridge—Imp. in electro thermal baths. (A com.)
3239. B. Browne, 49, King William-street—Imp. in the construction of knobs or handles of door locks, and in the mode of connecting the same with the sliding bolts thereof for advancing and drawing back said bolts. (A com.)

Dated 3*rd December*, 1862.

3241. A. T. Becks, Birmingham—Imp. in machinery for cutting or shearing sheets or plates of metal.
3243. C. F. Claus, Fearnhead, Lancashire—Imp. in carboy hampers and in the machinery or other means for manufacturing the same.
3244. A. Morton, Arbroath—Imp. in lawn-mowing machines.
3245. W. H. Browne, 29, Alwyne-road, Canonbury—Imp. in gas stoves.
3247. A. F. Eden, Threadneedle street—Imp. in apparatus for taking minute photographic pictures and magnified pictures of microscopic objects.

Dated 5*th December*, 1862.

3264. T. E. Blackwell, Orsett-terrace, Hyde-park—Imp. in barometers or instruments for measuring altitudes or the pressure of the atmosphere or elastic fluids.
3268. E. Walton, Wood-street—An improved article of wearing apparel for the neck.

Dated 6*th December*, 1862.

3272. J. Craig and M. Craig, Kilmarnock—Imp. in apparatus for the manufacture of clay.
3274. W. McNaught, Rochdale—Imp. in machinery for washing and drying textile fabrics and materials.
3276. J. Burchall, St. Helen's, and E. Burrows, Sutton, Lancashire—Imp. in propellers for ships and other navigable vessels.
3278. R. McClintock, Dublin—Imp. in carriage axles.

Dated 8*th December*, 1862.

3286. R. A. Brooman, 166, Fleet-street—Imp. in kneading machines. (A com.)

PATENTS SEALED.

[*From Gazette, December* 19*th*, 1862.]

December 19*th.*

1850. W. Hargreaves, and G. H. Leather.
1851. T. Carr.
1868. J. Whitham.
1869. G. Turner.
1876. J. Parkes.
1882. J. Watson.
1888. R. A. Brooman.
1889. A. H. Martin.
1890. I. Holden.
1891. A. A. Croll.
1897. G. H. Hulskamp.
1898. J. Garnier.
1901. J. Tatham.
1902. J. Petrie.
2585. C. Mertens.
2693. T. Keech.
2754. C. McCarthy.
2805. J. Davies and G. Davies.

[*From Gazette, December* 23*rd*, 1862.]

December 23*rd.*

1905. J. Wall and T. Dodd.
1906. W. Thomas.
1922. J. M. Dunlop.
1943. J. Miles.
1973. A. Gilbey.
1976. C. F. W. Rust.
2009. J. H. Johnson.
2042. R. Dunn.
2064. W. E. Newton.
2080. A. Fournier.
2096. A. Vignon.
2121. T. Sagar and J. Rocliff.
2237. H. B. Barlow.
2627. C. D. Abel.
2867. G. J. Firmin.
2736. H. A. Marinoni.
2935. G. Haseltine.

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

[*From Gazette, December* 23*rd*, 1862.]

December 17*th.*

2883. G. S. Goodall.
2898. G. Collier and J. Collier.

December 18*th.*

2900. W. Henderson.
2946. W. E. Newton.

December 19*th.*

2896. J. Willcock.
2906. J. H. Johnson.
2950. T. S. Truss.
2975. T. S. Cressy.

December 20*th.*

2892. J. Fairclough.
2909. S. Plimsoll.

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

[*From Gazette, December* 23*rd*, 1862.]

December 20*th.*

2909. J. Chesterman.